

June 2001

Materials scientist turns disappointment into success

by Timothy Anderl, Materials and Manufacturing Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — As a cadet at the Air Force Academy Dr. Wade Adams faced a serious career choice. He faced the disappointment of not being pilot qualified due to problems with eyesight and allergies. Adams' counselor, a member of the physics department, promised an alternate path that would lead him to constant intellectual challenges and lifelong learning.

Thirty-four years later, the encouragement of his counselor and a passion for science, which he developed as a student, has led him to the position as chief scientist of Air Force Research Laboratory's Materials and Manufacturing Directorate.

"I came from a small high school in Texas where we had one teacher who taught general science, biology, chemistry and physics," Adams said. "He could teach and motivate in any of the technical areas, was friendly and talkative and related to us because he knew and understood the natural world around us.

"So, I had two science teachers as a young student who really encouraged me, one was a physicist and the other was a

general scientist. They taught me to appreciate science, and I found that I really enjoyed it."

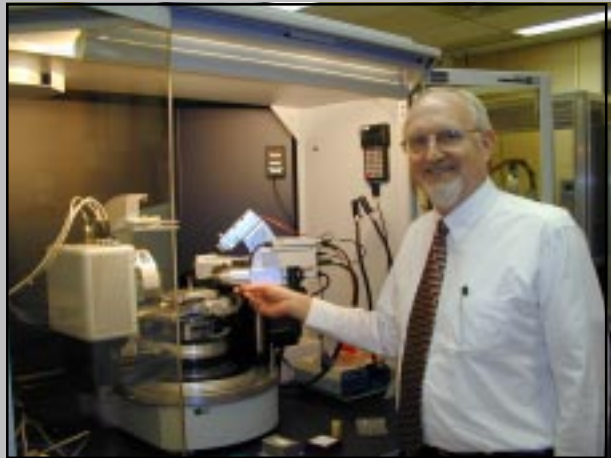
During his time at the academy, Adams had his first taste of an Air Force laboratory. Participating in the Cadet Summer Research Program, Adams spent the summer of 1967 working at the Aerospace Research Laboratory at Wright-Patterson AFB, Ohio.

"The thing I remember most about the program is the camaraderie of the research group," Adams said. "From the most junior to most senior person, we all recognized that we were scientists working together to solve seemingly insurmountable problems — and succeeding."

Every other Friday, members of the research group would take a break from in-house research to meet at the 19th Hole (now Wings), the Officers' Club basement meeting place to spend the afternoon talking about technical issues over cheese, crackers and beer. This camaraderie both when they socialized, and during duty hours is part of what drew Adams to his full-



1971 — In the Electromagnetic Materials Branch, Materials Physics Division of the AF Materials Lab, 1st Lt. Adams uses a Guinier de Wolff x-ray camera to study the crystalline structure of rare earth permanent magnet materials, which were invented in that branch.



2001 — In the Polymer Branch of the Materials and Manufacturing Directorate's Nonmetallic Materials Division Dr. Adams stands at the new Bruker D8 Discover X-ray Diffractometer System. This equipment is in the newly upgraded "Gehatia Morphology Laboratory," originally built by Dr. Adams in the 70s and 80s to study structure-property relationships in high-performance polymeric materials.

Dr. Adams continued from page 1

time position at the directorate.

Adams' first Air Force assignment was at Vanderbilt University where he pursued a master's degree in health physics. It wasn't long before he returned to Wright-Patterson for his second assignment in the Nuclear Engineering Center at the Air Force Institute of Technology.

Four months later the program was shut down, and Adams found a home at the Materials and Manufacturing Directorate working on rare earth cobalt magnets in the Electromagnetic Materials Branch.

Over the last 30 years, Adams has seen numerous changes in the directorate. As an officer he worked as an assistant branch chief of the Programs Office where he was instrumental in automating the lab's financial processes. After two years he resigned his commission, taking a permanent government civil service position in the Polymer Branch. Since then he has served as a research scientist, senior scientist and now chief scientist of the directorate.

As chief scientist, he is responsible for providing consultative and advisory service to the laboratory director and his staff on the technical and scientific merit of the laboratory's research and development programs.

"The job of chief scientist is the best of the senior leadership jobs in any organization because you get the fun of working with the best technical 'brains'," Adams said. "The job of chief scientist puts me in touch with the technical side of the lab. I am the technical advisor and spiritual leader of the in-house program. I am entrusted with the care of all the incredible scientists and engineers that we have."

Despite all the shuffling and the renaming of the laboratory, Adams has steadfastly endured all the changes to the directorate. He said the excellence of the directorate's people and their ability to solve tough problems have remained unchanged.

"This laboratory has always worked on important problems for the Air Force because materials are the 'stuff of things'," Adams said. "We joke about that, but everyone relates 'things' like aircraft and operational systems to the Air Force. But we are the directorate that makes the materials, the 'stuff,' that enable those systems; we are vital to everything that the Air Force does."

Adams has enjoyed the opportunity to see what the "flying" Air Force is like during "joy" rides in an F-4, B-52, F-101, and a T-33 (he hopes to someday ride in an F-16!).

"I've wandered around on the flight line and talked to the maintenance guy about his problems of inspecting particular panels, and I've talked to four star generals about what new technologies they need to solve their problems today and tomorrow," Adams said. "To fully realize the breadth and scope of our role here, we need to see the big picture – we need to know how to connect to our customers and work their problems."

"I've learned that it is impossible as a scientist to solve these kinds of problems if you are isolated in a lab and aren't able to see firsthand how the directorate's research connects to the problems of the Air Force."

During his time at the directorate, Adams has also made significant efforts to extend an invitation to young minds to sample the directorate's unique culture. In 1990, Dr. Vince Russo, then director of the directorate, relayed a request from the director of the Challenger Center at Kaiser who wanted to give teachers and students the opportunity to look through an electron microscope (a special microscope that can enlarge images thousands of times).

Russo and Adams agreed that teachers and students would benefit tremendously by the opportunity to use the microscopes and the Scanning Electron Microscope Educators (SEMEDS) program was born.

"When you have something like a fly's head in the microscope and you put a student in front of this machine and allow them to crank the knobs, as the image jumps at them with its faceted eyes, the look on their faces is fantastic," Adams said. "That was the very first education outreach program we put together and it is still booked up solid today."

"Because of SEMEDS' success we started searching around for other programs and became involved in an Artificial Intelligence Tutor Program [a computer-based training program that was implemented and evaluated in urban Dayton high schools], programs that bring teachers out for summer mentorships to recharge their batteries, and numerous other programs. I've gotten a lot of enjoyment and satisfaction out of helping kids and their teachers, and encouraging their lifelong learning just as my mentors did for me."

Adams admits that some of his learning has occurred outside the lab as an enjoyable diversion from the pressures of the job. During his first assignment at Wright-Patt, he began to learn volleyball. Col. Crocker, his commander, encouraged the military personnel to play on the asphalt court outside the building at lunch time. This inclination continued when Adams transferred to the Materials and Manufacturing Directorate.

"After a couple of years, we were on the base team, playing at a pretty high level – there were a lot of great players to learn from then," Adams said. "If something went a little rough at work, I would get down on the court and take it out on a ball or the other players. I was able to relieve a lot of frustrations that way."

When the U.S. national team came to Dayton to locate a national training site for the Olympics, Adams became involved as a volunteer and ended up in charge of international exhibitions. He hosted the first athletic match between Fidel Castro's Cuba and the U.S. in 1977. He also accompanied the team as manager on a three-week trip to the World Cup tournament in Japan.

While at the Air Force Academy, Adams helped to organize the cadet band, which eventually evolved into the Cadet Drum and Bugle Corp. He has also played trombone and tuba in the town band of Amherst, Mass., while there for his Ph.D. and with the Materials and Manufacturing Directorate band when it was actively performing. He continues to play tuba during an annual downtown Dayton Christmas celebration, "Tuba Christmas," where tuba players gather to serenade onlookers with carols.

Dr. Adams continued from page 2

“Over the last few years, I have also picked up a love for deep sea fishing,” said Adams. “We’ve been meeting friends with this similar interest and going after the big ones like marlin, sail fish and tuna. I’m taking a week long deep sea fishing course in North Carolina in June that I’m hoping will help me catch and release more of the really big fish.”

In addition, Adams is involved, as a private citizen, in science and technology organizations around the Dayton Area. He is a past president of the Engineers Club and is currently the president of the Engineering and Science Foundation, which supports regional technology opportunities.

Adams’ fervor for meeting challenges and continuing to learn is evident in all that he does; whether he is belting out a tune on the tuba, getting the inside scoop on hooking the ‘big one’, or waving the directorate’s flag for his friends in the lab.

“When you hear folks talk about the ‘gray beards’ in the lab, they are talking about guys like me. I have 37 years with the Air Force and my wife says I have ‘blue blood’ running through my veins,” Adams said. “This is just something that I’ve always done and my experiences have been fantastic.” @